SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

1. GENERAL
	* + 1. RELATED DOCUMENTS
				1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
			2. SUMMARY
				1. Section Includes:

Standard and custom hollow metal doors and frames.

Steel sidelight, borrowed lite and transom frames.

Louvers installed in hollow metal doors.

Light frames and glazing installed in hollow metal doors.

Factory finishing hollow metal doors and frames and factory machining for hardware.

* + - * 1. Related Sections:

Division 01 Section "Sustainable Design Requirements" for additional LEED documentation and requirements.

Division 04 Section "Unit Masonry" for embedding anchors for hollow metal work into masonry construction.

Division 08 Section “Flush Wood Doors”.

Division 08 Section "Clad Wood Doors”.

Division 08 Section "Stile and Rail Wood Doors".

Division 08 Section "Glazing" for glass view panels in hollow metal doors.

Division 08 Section "Door Hardware".

Division 08 Section "Access Control Hardware".

Division 09 Sections "Exterior Painting" and "Interior Painting" for field painting hollow metal doors and frames.

Division 26 "Electrical" Sections for electrical connections including conduit and wiring for door controls and operators installed on frames with factory installed electrical knock out boxes.

Division 28 Section "Access Control" for access control devices installed at door openings and provided as part of a security access control system.

* + - * 1. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.

ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.

ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.

ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.

ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.

ANSI/SDI A250.13 - Testing and Rating of Severe Windstorm Resistant Components for Swing Door Assemblies.

ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.

ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

ASTM A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.

ASTM C 1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.

ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.

ASTM E283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Doors Under Specified Pressure Differences Across the Specimens.

ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

ASTM E 413 - Classification for Rating Sound Insulation.

ASTM E1332 - Standard Classification for Determination of Outdoor-Indoor Transmission Class.

ASTM E1886 - Test Method for Performance of Exterior Windows, Curtin Walls, Doors and Shutters Impacted by Missiles and Exposed to Cyclic Pressure Differentials.

ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Windborne Debris in Hurricanes.

ANSI/NAAMM/HMMA 867-06 - Guide Specifications for Commercial Laminated Core Hollow Metal Doors and Frames.

ANSI/BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.

ANSI/SDI 122 - Installation and Troubleshooting Guide for Standard Steel Doors and Frames.

ANSI/NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.

ANSI/NFPA 105: Standard for the Installation of Smoke Door Assemblies.

FEMA 361 2008 – Design and Construction Guidance for Community Safe Rooms.

ICC 500 - ICC/NSSA Standard for the Design and Construction of Storm Shelters.

NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.

TAS-201-94 - Impact Test Procedures.

TAS-202-94 - Criteria for Testing Impact and Non-Impact Resistant Building Envelope Components using Uniform Static Air Pressure.

TAS-203-94 - Criteria for Testing Products Subject to Cyclic Wind Pressure Loading.

UFC 4-010-0 - Department of Defense Minimum Antiterrorism Standards for Building, October 2003, including Change 1, January 2007.

UL 10B - Fire Test of Door Assemblies.

UL 10C - Positive Pressure Fire Tests of Door Assemblies.

UL 1784 - Standard for Air Leakage Tests of Door Assemblies.

* + - 1. SUBMITTALS
				1. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, hardware reinforcements, profiles, anchors, fire-resistance rating, and finishes.
				2. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the steel door and frame supplier in order to prepare the doors and frames to receive the finish hardware items.
				3. Shop Drawings: Include the following:

Elevations of each door design.

Details of doors, including vertical and horizontal edge details and metal thicknesses.

Frame details for each frame type, including dimensioned profiles and metal thicknesses.

Locations of reinforcement and preparations for hardware.

Details of anchorages, joints, field splices, and connections.

Details of accessories.

Details of moldings, removable stops, and glazing.

Details of conduit and preparations for power, signal, and control systems.

* + - * 1. Samples for Verification:

Samples are only required by request of the architect and for manufacturers that are not current members of the Steel Door Institute.

* + - * 1. Informational Submittals:

LEED Documentation: Submit manufacturer's environmental documentation and applicable sustainability program credits for MR-4 and that are specified herein. Submit manufacturer’s health product declaration (HPD) for products of this section.

Hurricane Resistant Openings: Exterior hurricane opening assemblies to be tested according to ASTM E330, ASTM E1886, ASTM E1996 standards, and certified by a qualified independent third party testing agency acceptable to authority having jurisdiction, with labeling indicating compliance with the wind load and design pressure level requirements specified for the Project.

Hurricane Resistant Openings (State of Florida): Within the State of Florida, provide copy of current State of Florida Product Approval or Metro-Dade County Notice of Acceptance (NOA) as proof of compliance that doors, frames and hardware for exterior opening assemblies have been tested and approved for use at the wind load and design pressure level requirements specified for the Project.

Hurricane Resistant Components (State of Florida): Within the State of Florida, provide copy of independent, third party certified listing conforming to ANSI A250.13.

* + - 1. QUALITY ASSURANCE
				1. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.
				2. Quality Standard: In addition to requirements specified, comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".
				3. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 (neutral pressure at 40” above sill) or UL 10C.

Oversize Fire-Rated Door Assemblies Construction: For units exceeding sizes of tested assemblies, attach construction label certifying doors are built to standard construction requirements for tested and labeled fire rated door assemblies except for size.

Temperature-Rise Limit: Where indicated and at vertical exit enclosures (stairwell openings) and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.

Smoke Control Door Assemblies: Comply with NFPA 105.

Smoke "S" Label: Doors to bear “S” label, and include smoke and draft control gasketing applied to frame and on meeting stiles of pair doors.

* + - * 1. Fire-Rated, Borrowed-Light Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257. Provide labeled glazing material.
				2. Energy Efficient Exterior Openings: Comply with minimum thermal ratings, based on ASTM C1363. Openings to be fabricated and tested as fully operable, thermal insulating door and frame assemblies.

Thermal Performance (Exterior Openings): Independent testing laboratory certification for exterior door assemblies being tested in accordance with ASTM C1363 and meet or exceed the following requirements:

Door Assembly Operable U-Factor and R-Value Ratings: U-Factor 0.29, R-Value 3.4, including insulated door, thermal-break frame and threshold.

Air Infiltration (Exterior Openings): Independent testing laboratory certification for exterior door assemblies being tested in accordance with ASTM E283 to meet or exceed the following requirements:

Rate of leakage of the door assembly shall not exceed 0.25 cfm per square foot of static differential air pressure of 1.567 psf (equivalent to 25 mph wind velocity).

* + - * 1. Hurricane Resistant Exterior Openings: Provide exterior hollow metal doors and frames as complete and tested assemblies, or component assemblies, including approved hardware specified under Section 087100 "Door Hardware", to meet the wind loads, design pressures, debris impact resistance, and glass and glazing requirements applicable to the Project.

Test units according to ASTM E330, ASTM E1886, ASTM E1996 standards, certified by a qualified independent third party testing agency acceptable to authority having jurisdiction, and bearing a third party certification agency permanent label indicting windstorm approved product.

* + - * 1. Hurricane Resistant Exterior Openings (State of Florida including High Velocity Hurricane Zone (HVHZ): Provide exterior hollow metal doors and frames as complete and tested assemblies, or component assemblies, including approved hardware specified under Section 087100 "Door Hardware", to meet the wind loads, design pressures, debris impact resistance, and glass and glazing requirements as detailed in the current State of Florida building code sections applicable to the Project.

Each unit to bear third party permanent label in accordance with Florida Building Code requirements.

* + - * 1. Hurricane Resistant Exterior Openings (State of Texas): Provide exterior hollow metal and door hardware assemblies approved by the Texas Department of Insurance, including anchorage, capable of withstanding wind load design pressures calculated for this project by a registered architect or engineer and are part of the construction documents per the Texas Department of Insurance, authorities having jurisdiction, and the International Building Code Design Loads Section 1609.

Each unit to bear third party permanent label in accordance with the Texas Department of Insurance requirements applicable to project.

Hurricane-Resistance Test Performance: Provide hollow metal and door hardware approved assemblies that pass large missile-impact tests, as required by Texas Department of Insurance systems location above grade and cyclic-pressure tests according to testing requirements of authorities having jurisdiction.

Impact Resistance: Hollow metal with approved door hardware assemblies must satisfy the Texas Department of Insurance’s criteria for protection from windborne debris in both the Inland I zone and the Seaward zone. Assemblies must pass the large missile impact test (which equates to Missile Level D specified in ASTM E 1996-02). Assemblies may be installed at any height on the structure as long as the design pressure rating for the assemblies is not exceeded.

* + - * 1. Severe Storm Shelter Openings: Provide complete door systems for hurricane or tornado storm shelters, and other areas of refuge, complying and tested according to FEMA 361, Second Edition (2008), Design and Construction Guidance for Community Safe Rooms; and ICC 500 (2008), ICC/NSSA Standard for the Design and Construction of Storm Shelters.

Each unit to bear third party permanent label indicating compliance with the referenced testing standards.

* + - * 1. Sound Transmission Class (STC) Rated Doors: Provide sound transmission class rated doors fabricated as sound-reducing types with testing according to ASTM E 90, and classifications according to ASTM E 413. Submit manufacturer’s written results of STC ratings from testing performed by a qualified independent testing agency for sound resistant doors.
				2. Pre-Submittal Conference: Conduct conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for installing hollow metal doors and frames and to verify installation of electrical knockout boxes and conduit at frames with electrified or access control hardware.
			1. DELIVERY, STORAGE, AND HANDLING
				1. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.
				2. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
				3. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.

Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.

* + - 1. PROJECT CONDITIONS
				1. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.
			2. COORDINATION
				1. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.
			3. WARRANTY
				1. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
				2. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.
1. PRODUCTS
	* + 1. MANUFACTURERS
				1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Curries Company.

Security Metal Products.

Steelcraft Mfg Co.

Member of NAAMM - Substitutions: Material from custom hollow metal door and frame fabricators will not be accepted without prior written and sample approval in accordance with requirements specified in Division 01. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

* + - 1. MATERIALS
				1. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
				2. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.
				3. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 38 percent.
				4. Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.
			2. STANDARD HOLLOW METAL DOORS
				1. General: Provide 1-3/4 inch doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8.
				2. Exterior Doors: Face sheets fabricated of commercial quality hot-dipped zinc coated steel that complies with ASTM A 653/A 653M, Coating Designation A60. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:

Design: Flush panel.

Core Construction: Manufacturer's standard polystyrene. Where indicated, provide doors fabricated as thermal-rated assemblies with a minimum R-value of 2.8 or better.

Core Construction: Manufacturer's standard polyurethane. Where indicated, provide doors fabricated as thermal-rated assemblies with a minimum R-value of 3.2 or better.

Core Construction: Manufacturer's standard vertical steel-stiffener core. Minimum 22 gauge steel-stiffeners at 6 inches on-center construction attached by spot welds spaced not more than 5" on centers. Spaces between stiffeners filled with fiberglass insulation (minimum density 0.8#/cubic ft.).

Level/Model: Level 3 and Physical Performance Level A (Extra Heavy Duty), Minimum 16 gauge (0.053-inch - 1.3-mm) thick steel, Model 2.

Level/Model: Level 2 and Physical Performance Level B (Heavy Duty), Minimum 18 gauge (0.042-inch - 1.0-mm) thick steel, Model 2.

Vertical Edges: Vertical edges to have the face sheets joined by a continuous weld extending the full height of the door. Welds are to be ground, filled and dressed smooth. Beveled Lock Edge, 1/8 inch in 2 inches (3 mm in 50 mm).

Vertical Edges: Vertical edges to have the face sheets spot welded and filled full height with an epoxy filler. Welds are to be ground, filled and dressed smooth. Beveled Lock Edge, 1/8 inch in 2 inches (3 mm in 50 mm).

Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet. Doors with an inverted top channel to include a steel closure channel, screw attached, with the web of the channel flush with the face sheets of the door. Plastic or composite channel fillers are not acceptable.

Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.

Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

* + - * 1. Interior Doors: Face sheets fabricated of commercial quality cold rolled steel that complies with ASTM A 1008/A 1008M. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:

Design: Flush panel.

Core Construction: Manufacturer's standard kraft-paper honeycomb, or one-piece polystyrene core, securely bonded to both faces.

Core Construction: Manufacturer's standard vertical steel-stiffener core. Minimum 22 gauge steel-stiffeners at 6 inches on-center construction attached by spot welds spaced not more than 5" on centers. Spaces between stiffeners filled with fiberglass insulation (minimum density 0.8#/cubic ft.).

Fire Door Core: As required to provide fire-protection and temperature-rise ratings indicated.

Level/Model: Level 2 and Physical Performance Level B (Heavy Duty), Minimum 18 gauge (0.042-inch - 1.0-mm) thick steel, Model 2.

Level/Model: Level 2 and Physical Performance Level B (Heavy Duty), Minimum 18 gauge (0.042-inch - 1.0-mm) thick steel, Model 1.

Level/Model: Level 3 and Physical Performance Level A (Extra Heavy Duty), minimum 16 gauge (0.053-inch - 1.3-mm) thick steel, Model 2.

Level/Model: Level 3 and Physical Performance Level A (Extra Heavy Duty), minimum 16 gauge (0.053-inch - 1.3-mm) thick steel, Model 1.

Vertical Edges: Vertical edges to have the face sheets joined by a continuous weld extending the full height of the door. Welds are to be ground, filled and dressed smooth. Beveled Lock Edge, 1/8 inch in 2 inches (3 mm in 50 mm).

Vertical Edges: Vertical edges to have the face sheets spot welded and filled full height with an epoxy filler. Welds are to be ground, filled and dressed smooth. Beveled Lock Edge, 1/8 inch in 2 inches (3 mm in 50 mm).

Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet. Doors with an inverted top channel to include a steel closure channel, screw attached, with the web of the channel flush with the face sheets of the door. Plastic or composite channel fillers are not acceptable.

Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.

Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

* + - * 1. Manufacturers Basis of Design:

Curries Company 607 Series.

Curries Company 707 Series.

Curries Company Steel-Stiffened: 747 Series.

Curries Company Temperature Rise: 727.

* + - 1. ENERGY-EFFICIENT HOLLOW METAL DOORS
				1. General: Provide 1-3/4 inch doors of design specified, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8 and ANSI/NAAMM HMMA 867.
				2. Energy Efficient Exterior Doors: Face sheets fabricated of commercial quality hot-dipped zinc coated steel that complies with ASTM A924 A60. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model, ANSI/SDI A250.4 for physical performance level, and HMMA 867 for door construction.

Design: Flush panel.

Core Construction: Foamed in place polyurethane and steel stiffened laminated core with no stiffener face welds, in compliance with HMMA 867 “Laminated Core”.

Provide 22 gauge steel stiffeners at 6 inches on-center internally welded at 5" on- center to integral core assembly, foamed in place polyurethane core chemically bonded to all interior surfaces. No stiffener face welding is permitted.

Thermal properties to rate at a fully operable minimum U-Factor 0.29 and R-Value 3.4, including insulated door, thermal-break frame and threshold.

Kerf Type Frames: Thermal properties to rate at a fully operable minimum U-Factor 0.36 and R-Value 2.7, including insulated door, kerf type frame, and threshold.

Level/Model: Level 2 and Physical Performance Level A (Heavy Duty), Minimum 18 gauge (0.042 inch - 1.1-mm) thick steel, Model 2.

Vertical Edges: Vertical edges to be mechanically interlocked with hairline seam. Beveled Lock Edge, 1/8 inch in 2 inches (3 mm in 50 mm).

Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet. Doors with an inverted top channel to include a steel closure channel, screw attached, with the web of the channel flush with the face sheets of the door. Plastic or composite channel fillers are not acceptable.

Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9".

Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

* + - * 1. Energy Efficient Interior Doors: Face sheets fabricated of commercial quality cold rolled steel that complies with ASTM A366 or 620. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:

Design: Flush panel.

Core Construction: Steel stiffened laminated core with fiberglass filler with no stiffener face welds, in compliance with HMMA 867 “Laminated Core”.

Provide 22 gauge steel-stiffeners at 6 inches on-center internally welded at 5" on- center to integral core assembly, No stiffener face welding is permitted.

Acoustical sound transmission rating shall be no less than STC 38 complying with ASTM E 90 and must be visible on factory applied labels.

Level/Model: Level 2 and Physical Performance Level A (Heavy Duty), Minimum 18 gauge (0.042 inch - 1.1-mm) thick steel, Model 2.

Vertical Edges: Vertical edgesto be mechanically interlocked with hairline seam. Beveled Lock Edge, 1/8 inch in 2 inches (3 mm in 50 mm).

Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet. Doors with an inverted top channel to include a steel closure channel, screw attached, with the web of the channel flush with the face sheets of the door. Plastic or composite channel fillers are not acceptable.

Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9".

Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

* + - * 1. Manufacturers Basis of Design:.

Curries Company 777 Trio-E/Trio Series.

* + - 1. HOLLOW METAL DOORS FOR SEVERE STORM SHELTERS
				1. General: Provide complete tornado or hurricane resistant door and frame shelter assemblies constructed to resist the design wind pressures for components and cladding and missile impact loads as described in ICC 500 - 2008, ICC/NSSA Standard for the Design and Construction of Storm Shelters. Only single opening and paired opening doors and their frames constructed to resist calculated design wind pressures and laboratory tested missile impacts are acceptable.

Door systems, both single doors and paired openings, tested and complying with ICC 500 and FEMA 361 (2008), Design and Construction Guidance for Community Safe Rooms and supported by third party test results.

Sheets fabricated on exterior openings from commercial quality hot dipped zinc coated steel complying with ASTM A924 A60. Gauges to be in accordance with manufacturers tested assemblies.

Vertical Edges: Vertical edges to have the face sheets joined by a continuous weld extending the full height of the door. Welds are to be ground, filled and dressed smooth. Beveled Lock Edge, 1/8 inch in 2 inches (3 mm in 50 mm).

Top Edge: Reinforce top of doors with a continuous steel channel extending the full width of the door and welded to the face sheet. Doors with an inverted top channel to include a steel closure channel, screw attached and welded in place with the web of the channel flush with the face sheets of the door. Plastic or composite channel fillers are not acceptable.

Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9".

* + - * 1. Manufacturers Basis of Design

Curries Company StormPro Series.

* + - 1. SPECIAL FUNCTION HOLLOW METAL DOORS
				1. Bullet Resistant Door Assemblies: Subject to the same compliance standards and requirements as standard hollow metal doors, provide manufacturer's custom bullet resistant internal door construction tested in accordance with U.L. Test Standard 752. Fabricate with concealed armor plate construction, 1-3/4" thickness, in the steel gauge required to meet indicated ballistic rating. Furnish as a complete unit with factory welded frame and approved listed hardware.

Provide bullet resistant assemblies with UL752 Level Rating of 1, 2, 3 or 4 as indicated.

Manufacturers Basis of Design:

Curries Company 737 Series.

* + - * 1. Embossed Wood Grain Doors: Subject to the same compliance standards and requirements as standard hollow metal doors, provide wood pattern engraved and stainable full flush or 6-panel embossed face sheets fabricated from minimum A40 galvannealed steel with vertical edges having a similar engraved wood grain stainable surface. Door faces and edges to be factory stained and protected with a ultra-violet (UV) resistant clear coating.

Provide doors with a minimum .005" wood grain embossing. The wood grain pattern is to match the grain pattern design of a typical wood stile and rail door.

Vision lites to match engraved wood grain design and stain of the door.

Manufacturers Basis of Design:

Curries Company CurriStain Series.

* + - * 1. Embossed and High Definition Embossed Doors: Subject to the same compliance standards and requirements as standard hollow metal doors, provide standard 6-panel and 8-panel, or high definition 1-panel and 2-panel, decorative embossed face sheets fabricated from minimum 18 gauge galvannealed steel, with polystyrene cores for structural strength and impact resistance.

Architectural Design Type: Provide panel configurations (1, 2, 6, 8 and/or arch and planked arch top) as shown.

Manufacturers Basis of Design:

Curries Company Embossed and HD Embossed Series.

* + - * 1. Security Door Assemblies: Subject to the same compliance standards and requirements as standard hollow metal doors, provide manufacturer's security door system tested in accordance with ANSI/NAAMM/HMMA 862-87 or 863-98 commercial and detention hollow metal standards. Fabricate with minimum 14 gauge construction, 2" thickness, reinforced with 18 gauge steel stiffeners welded to the face sheets every 4" on center with spot welds 4" on center the full height of the door and minimum 10 gauge inverted steel end channels welded to both face sheets. Furnish as a complete unit with factory welded frame.

Manufacturers Basis of Design:

Curries Company 857 Series.

* + - * 1. Sound Resistant Doors: Subject to the same compliance standards and requirements as standard hollow metal doors, provide manufacturer's standard sound resistant acoustic core tested in accordance with ASTM E90, ASTM 413, and ASTM E1332 standards. Fabricate with minimum 16 gauge construction, 1-3/4" thickness, combined with standard flush frames designed for mid-range and high range sound attenuation from STC 39 through STC 52 applications. Furnish complete with perimeter sound seals, bottom seals, and threshold as required for specified STC rating.

Provide sound resistant doors with minimum STC sound rating (32, 38, 41, 43, 46, 50, 52, 54) as indicated on the door schedule:

Each unit to bear a physical label applied to door certifying the product construction and identifying the specific STC rating.

Manufacturers Basis of Design:

Curries Company 757 Quiet Noise Series.

* + - * 1. Stainless Steel Doors: Subject to the same compliance standards and requirements as standard hollow metal doors, provide 1-3/4" thick doors fabricated from #304 alloy (#316 alloy high corrosive resistant where indicated) stainless steel material complying with ANSI/ASTM A167. Fabricate doors with stainless flush top closure, and 12 gauge minimum stainless steel hinge reinforcements and 18 gauge minimum stainless steel lock reinforcements.

Finish: Provide finish (No.4 with visible grain or No. 8, mirror) as directed.

Manufacturers Basis of Design:

Curries Company Stainless Steel Series.

* + - 1. STANDARD HOLLOW METAL FRAMES
				1. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.
				2. Exterior Frames: Fabricated of hot-dipped zinc coated steel that complies with ASTM A 653/A 653M, Coating Designation A60.

Fabricate frames with mitered or coped corners.

Fabricate frames, with the exception of knock down types, with "closed and tight" miter seams continuously welded on face, finished smooth with no visible seam unless otherwise indicated.

Frames for Level 3 Steel Doors (up to 48 inches in width): Minimum 14 gauge (0.067-inch -1.7-mm) thick steel sheet.

Frames for Level 3 Steel Doors (48 inches and up in width): Minimum 12 gauge (0.081-inch -2.7-mm) thick steel sheet.

Frames for Level 2 Steel Doors: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.

Manufacturers Basis of Design:

Curries Company M/G Series.

* + - * 1. Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.

Fabricate frames with mitered or coped corners.

Fabricate frames, with the exception of slip-on drywall types, with "closed and tight" miter seams continuously welded on face, finished smooth with no visible seam unless otherwise indicated.

Frames for Steel Doors: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.

Frames for openings up to 48 inches in width: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.]

Frames for openings 48 inches and wider in width: Minimum 14 gauge (0.067-inch -1.7-mm) thick steel sheet.]

Frames for Wood Doors: Minimum 16 gauge (0.053-inch-1.3-mm-) thick steel sheet.

Frames for Borrowed Lights: Minimum 16 gauge (0.053-inch-1.3-mm-) thick steel sheet.

Manufacturers Basis of Design

Curries Company C/CM/CG Series (Drywall Profile).

Curries Company M/G Series (Masonry Profile).

* + - * 1. Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated.
				2. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.
			1. ENERGY-EFFICIENT HOLLOW METAL FRAMES
				1. Thermal Break Frames: Subject to the same compliance standards and requirements as standard hollow metal frames, provide where indicated thermally broken frame profiles available for use in both masonry and drywall construction. Fabricate from minimum 16 gauge galvannealed steel, with positive 3/8" vinyl thermal break and integral vinyl weatherstripping.

Manufacturers Basis of Design:

Curries Company - Thermal Break M and C Series.

* + - * 1. Weatherstripped Frames: Subject to the same compliance standards and requirements as standard hollow metal frames, provide where indicated weatherstripped profiles with 1/8" integral kerf formed into the frame soffit able to receive manufacturer's listed gasket material. Available for use in both masonry and drywall construction, with fire rating up to 3 hours complying with NFPA 105, UL 1784, and ASTM E-283 Test criteria.

Manufacturers Basis of Design:

Curries Company - Weatherstripped WC/WM Series.

* + - 1. FRAMES FOR SEVERE STORM SHELTERS
				1. General: Subject to the same compliance standards and requirements as standard hollow metal frames, provide complete tornado or hurricane resistant door and frame assemblies, for both single doors and paired openings, tested and labeled as complying with ICC 500 and FEMA 361 and supported by third party test results.

Fabricate exterior frames from 14 gauge hot dipped zinc coated steel that complying with ASTM designations A924 A60.

Manufacturers Basis of Design

Curries Company - StormPro Series.

* + - 1. SPECIAL FUNCTION HOLLOW METAL FRAMES
				1. Bullet Resistant Frame Assemblies: Subject to the same compliance standards and requirements as standard hollow metal frames, provide where indicated manufacturer tested bullet resistance frame as part of a complete door and frame system. Fabricate bullet resistance frames from minimum 12 gauge steel with fully welded construction.

Manufacturers Basis of Design

Curries Company 737 Series Frames.

* + - * 1. Egress Marking System Frames: Subject to the same compliance standards and requirements as standard hollow metal frames, provide where indicated electro-luminescent or photo-luminescent frame and door preparations as part of a complete egress marking system. Framing system is designed to augment existing exit signage by providing a highly visible light strip around the perimeter of an opening designated as part of the egress pathway. Door system preparations are available for two types of low-level exit signs mounted to the door face. Fabricate frames from minimum 16 gauge steel, with saw mitered welded corner construction.

Electro-Luminescent System: Electrified egress marking system unit with customized frame lighting preparation and power options. Electro-luminescent units are wired into the building's emergency system providing brightly lighted pathway to exit.

Photo-Luminescent System: Non-electrified, stand-alone egress pathway frame units with a photo-luminescent strip placed in a preformed channel with up to 90 minutes of emergency illumination without power.

Manufacturers Basis of Design:

Curries Company CURRIElum System.

* + - * 1. Security Frame Assemblies: Subject to the same compliance standards and requirements as standard hollow metal frames, provide where indicated manufacturer tested security frame as part of a complete door and frame assembly. Fabricate security frames from minimum 14 gauge steel, fully welded, including heavy duty security hinge reinforcements, and welded-in detention 12 gauge masonry anchors.

Manufacturers Basis of Design:

Curries Company 857 Series Frames.

* + - * 1. Security Sidelight Frames: Subject to the same compliance standards and requirements as standard hollow metal frames, provide where indicated sidelight frames with hinged security panel to create a visual barrier to potential intruders. Security panel prepared for self latching deadbolt covering for glass pockets accommodating up to 1" thick glass. Fabricate security sidelight frames from minimum 16 gauge steel with fully welded construction.

Manufacturers Basis of Design:

Curries Company Security Sidelite Unit.

* + - * 1. Stainless Steel Frames: Subject to the same compliance standards and requirements as standard hollow metal frames, provide where indicated frames fabricated from #304 alloy (#316 alloy, high corrosive resistant where indicated) stainless steel material in finish matching stainless steel doors.

Manufacturers Basis of Design:

Curries Company Stainless Steel Frame Series.

* + - 1. FRAME ANCHORS
				1. Jamb Anchors:

Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, formed from A60 metallic coated material, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.

Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.

Compression Type for Drywall Slip-on (Knock-Down) Frames: Adjustable compression anchors.

Windstorm Opening Anchors: Types as tested and required for indicated wall types to meet specified wind load design criteria.

FEMA 361 Storm Shelter Anchors: Masonry T-shaped, wire masonry type, or existing opening type anchors.

* + - * 1. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.
				2. Mortar Guards: Formed from same material as frames, not less than 0.016 inches thick.
			1. HOLLOW METAL PANELS
				1. Provide hollow metal panels of same materials, construction, and finish as specified for adjoining hollow metal work.
			2. LOUVERS
				1. Metal Louvers: Door manufacturer's standard metal louvers unless otherwise indicated.

Blade Type: Vision proof inverted V or inverted Y.

Metal and Finish: Galvanized steel, 0.040 inch thick, factory primed for paint finish with baked enamel or powder coated finish. Match pre-finished door paint color where applicable.

* + - * 1. Louvers for Fire Rated Doors: Metal louvers with fusible link and closing device, listed and labeled for use in doors with fire protection rating of 1-1/2 hours and less.

Manufacturers: Subject to compliance with requirements, provide door manufacturers standard louver to meet rating indicated.

Metal and Finish: Galvanized steel, 0.040 inch thick, factory primed for paint finish with baked enamel or powder coated finish. Match pre-finished door paint color where applicable.

* + - 1. LIGHT OPENINGS AND GLAZING
				1. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints at fabricator’s shop. Fixed and removable stops to allow multiple glazed lites each to be removed independently. Coordinate frame rabbet widths between fixed and removable stops with the type of glazing and installation indicated.
				2. Moldings for Glazed Lites in Doors and Loose Stops for Glazed Lites in Frames: Minimum 20 gauge thick, fabricated from same material as door face sheet in which they are installed.
				3. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated. Provide fixed frame moldings and stops on outside of exterior and on secure side of interior doors and frames
				4. Preformed Metal Frames for Light Openings: Manufacturer's standard frame formed of 0.048-inch-thick, cold rolled steel sheet; with baked enamel or powder coated finish; and approved for use in doors of fire protection rating indicated. Match pre-finished door paint color where applicable.
				5. Glazing: Comply with requirements in Division 08 Section "Glazing" and with the hollow metal door manufacturer's written instructions.

Factory Glazing: Factory install glazing in doors as indicated. Doors with factory installed glass to include all of the required glazing material.

* + - 1. ACCESSORIES
				1. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.
				2. Grout Guards: Formed from same material as frames, not less than 0.016 inches thick.
			2. FABRICATION
				1. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.
				2. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.
				3. Hollow Metal Doors:

Exterior Doors: Provide optional weep-hole openings in bottom of exterior doors to permit moisture to escape where specified.

Glazed Lites: Factory cut openings in doors with applied trim or kits to fit. Factory install glazing where indicated.

Louvers: Factory cut openings in door and install louvers into prepared openings where indicated.

Astragals: Provide overlapping astragals as noted in door hardware sets in Division 08 Section "Door Hardware" on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted.

Continuous Hinge Reinforcement: Provide welded continuous 12 gauge strap for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".

Electrical Raceways: Provide hollow metal doors to receive electrified hardware with concealed wiring harness and standardized Molex™ plug connectors on both ends to accommodate up to twelve wires. Coordinate connectors on end of the wiring harness to plug directly into the electrified hardware and the through-wire transfer hardware or wiring harness specified in hardware sets in Division 08 Sections "Door Hardware" and "Access Control Hardware". Wire nut connections are not acceptable.

* + - * 1. Hollow Metal Frames:

Shipping Limitations: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.

Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.

Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.

Welded Frames: Weld joints continuously through full throat width of frames, including rabbets, soffits, and stops; grind, fill, dress, and make smooth, flush, and invisible.

Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.

Knocked Down Frames: Provide frames with locking corner tabs which permit field assembly. Factory install compression type anchors and countersunk screw holes to secure the bottom of the jambs.

Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.

Equal Rabbet Frames: Provide frames with equal rabbet dimensions unless glazing and removable stops require wider dimensions on glass side of frame.

High Frequency Hinge Reinforcement: Provide high frequency hinge reinforcements at door openings 48-inches and wider with mortise butt type hinges at top hinge locations.

Continuous Hinge Reinforcement: Provide welded continuous 12 gauge straps for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".

Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.

Hospital (Terminated) Stops: Where indicated on the drawings, provide frame stops that terminate six inches above the bottom of each jamb. Close the bottom of the stop at a 45 degree angle.

Mortar Guards: Provide guard boxes at back of hardware mortises in frames at all hinges and strike preps regardless of grouting requirements.

Electrical Thru-Wiring: Provide hollow metal frames receiving electrified hardware with loose wiring harness (not attached to open throat components or installed in closed mullion tubes) and standardized Molex™ plug connectors on one end to accommodate up to twelve wires. Coordinate connectors on end of the wiring harness to plug directly into the electric through-wire transfer hardware or wiring harness specified in hardware sets in Division 08 Sections "Door Hardware" and "Access Control Hardware".

Electrical Knock Out Boxes: Factory weld 18 gauge electrical knock out boxes to frame for electrical hardware preps; including but not limited to, electric through wire transfer hardware, electrical raceways and wiring harnesses, door position switches, electric strikes, magnetic locks, and jamb mounted card readers as specified in hardware sets in Division 08 Sections "Door Hardware" and "Access Control Hardware".

Provide electrical knock out boxes with a dual 1/2-inch and 3/4-inch knockouts.

Conduit to be coordinated and installed in the field (Division 26) from middle hinge box and strike box to door position box.

Electrical knock out boxes to comply with NFPA requirements and fit electrical door hardware as specified in hardware sets in Division 08 Section "Door Hardware".

Electrical knock out boxes for continuous hinges should be located in the center of the vertical dimension on the hinge jamb.

Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.

Jamb Anchors: Provide number and spacing of anchors as follows:

Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:

Two anchors per jamb up to 60 inches high.

Three anchors per jamb from 60 to 90 inches high.

Four anchors per jamb from 90 to 120 inches high.

Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.

Stud Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:

Three anchors per jamb up to 60 inches high.

Four anchors per jamb from 60 to 90 inches high.

Five anchors per jamb from 90 to 96 inches high.

Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.

Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions.

Severe Storm Shelter Openings: Provide jamb, head, and sill anchors in accordance with manufacturer’s tested and approved assemblies.

Door Silencers: Except on weatherstripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".

Bituminous Coating: Where frames are fully grouted with an approved Portland Cement based grout or mortar, coat inside of frame throat with a water based bituminous or asphaltic emulsion coating to a minimum thickness of 3 mils DFT, tested in accordance with UL 10C and applied to the frame under a 3rd party independent follow-up service procedure.

* + - * 1. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."

Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.

Reinforce doors and frames to receive non-template, mortised and surface mounted door hardware.

Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.

Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

* + - 1. STEEL FINISHES
				1. Prime Finishes: Doors and frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the door and frame exposed to view to receive a factory applied coat of rust inhibiting shop primer.

Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

* + - * 1. Factory Pre-Finished: Factory apply electrostatic paint finish to doors and frames in accordance with ANSI A250.3 test procedure acceptance criteria for factory applied finished coatings. Color as selected by the architect from manufacturer’s full range of standard colors.
1. EXECUTION
	* + 1. EXAMINATION
				1. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
				2. General Contractor to verify the accuracy of dimensions given to the steel door and frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc.).
				3. Proceed with installation only after unsatisfactory conditions have been corrected.
			2. PREPARATION
				1. Remove welded in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
				2. Prior to installation, adjust and securely brace welded hollow metal frames for squareness, alignment, twist, and plumbness.
				3. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."
				4. Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware.
			3. INSTALLATION
				1. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
				2. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.

Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.

Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.

Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.

Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.

* + - * 1. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.

Non-Fire-Rated Standard Steel Doors:

Jambs and Head: 1/8 inch plus or minus 1/16 inch.

Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.

Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.

Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.

Fire-Rated Doors: Install doors with clearances according to NFPA 80.

* + - * 1. Field Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.
			1. ADJUSTING AND CLEANING
				1. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.
				2. Remove grout and other bonding material from hollow metal work immediately after installation.
				3. Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

END OF SECTION 081113